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THE TREATMENT OF THE ACUTE STAGE OF POLIOMYELITIS FROM THE NURSES' STANDPOINT[1]

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Synonyms. Heine-Medin's Disease, Infantile Paralysis.

Historical. Poliomyelitis has only recently taken its place among the group of diseases called "infectious," following many recent bacteriological, pathological and clinical researches.

The first good clinical description of the disease was given by Heine in 1840; it was completed by the works of Rilliet and Barthez, Kennedy, Duchenne, Labordi, and later by those of Wickman, Medin, Ed. Muller, and most recently by the monograph of Peabody, Draper and Dochez. The pathological and essential lesions were first described by Prevost and Vulpean. Medin, P. Maria, and Wickman definitely confirmed the theory of the infectious nature of the malady. Epidemics of the disease have become more frequent and more severe since the beginning of the twentieth century. In 1905, 1000 cases occurred in Sweden; in 1905 and 1906, 1053 cases in Norway. In 1907, the disease appeared in New York City, 2000 cases developing. In 1908 and 1909 it spread throughout North America, and during these same years, the epidemics took on greater amplitude and the disease showed itself in Germany, in Austria and in the southern part of France. Since then the various epidemics have gradually subsided. The epidemic of New York City and vicinity in 1916 was the largest ever recorded in the history of the disease, comprising 9,023 cases during the period between June and November. It was made compulsory that all cases be placed in hospitals, if the required isolation could not be maintained at home. This proved an immense undertaking, and the Kingston Avenue Hospital during the period specified above, alone, admitted 1798 acute cases. Naturally a considerable number of interesting points in the treatment of the disease was observed amongst such a large number of patients. It is the purpose of this paper to give some of these observations, from a nurse's viewpoint, in as brief a manner as possible.

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1. Prophylaxis in treatment. It is necessary, in order to understand the measures used for the prevention of the dissemination of this disease, for the nurse to know something of the manner in which contagion occurs. We have now strong reason to believe that the causative agent of poliomyelitis is located primarily in the adenoid tissue of the naso-pharynx, and is given off from there into the salivary secretion, and the discharges from the nose, throat and eyes. It may be contained, as well, in the intestinal evacuations, owing to the fact that these secretions or discharges may be swallowed. An individual who is in contact with cases of the disease, whether it be the doctor, the nurse, or a relative of the patient, is very frequently infected in his or her naso-pharynx with the germs, but not being susceptible, does not develop the malady. He may nevertheless transmit the condition to others, or the poliomyelitic germ may be spread from the naso-pharynx of the person exposed to that of an individual not exposed, and from him on, as in a chain, through several individuals before a "susceptible" is reached who will then develop symptoms. Persons thus harboring the causative agent of the disease, but remaining perfectly normal themselves, are called "healthy carriers." Another extremely frequent method of dissemination is by the "abortive cases" which, owing to the transitory nature of the paralytic phenomena, are rarely recognized and yet, despite this, are just as infective as the frankly paralyzed cases. With these facts in mind, the difficulty of controlling an epidemic will easily be understood. Certain prophylactic measures were taken, however, in the treatment of the cases at the Kingston Avenue Hospital, based upon recent knowledge of the manner in which the disease may be spread. They were as follows: the wards were kept scrupulously clean, because the dirt upon the floor may be infective, as recent researches have proven. Care was exercised to carefully screen all windows and doors, so as to exclude flies, because they may be an occasional factor in transmission. All discharges from the patient's nose, throat and eyes, and all gauze soiled with such discharges were burned; the stools and urine were disinfected before removal. All clothing, bed linen, and dishes used in the wards were carefully sterilized before removal. Visitors were forbidden to touch or come into close contact with the patients, and were required to wear gowns while in the wards, as well as to wash their hands in a creolin solution ($\frac{1}{2}$ of 1%) before leaving. The doctors, nurses and maids on duty on the poliomyelitis wards wore gowns also, and they were recommended to use a spray of 1 part of hydrogen peroxide to 4 parts of water, in the nose and throat, before going off duty. While assigned to these wards, they were not allowed to perform duty upon the other services. The parents of patients were restricted to one visit, which was important for identification purposes, and the privilege of more frequent visits was extended only if the child were in a serious condition. The quarantine period was established at eight weeks, but later was changed to six weeks.

2. General treatment. Beds and bedding. A blanket mattress upon a woven wire spring was used, because it was found to be an excellent bed for patients with poliomyelitis, as it provided a level and a firm support. A spring which sags or a mattress worn in the center would do harm by predisposing to faulty positions and hence to deformities, especially those of the spine. Beds were made with a foundation blanket, rubber sheet, quilted mattress pad and a sheet. The upper sheet, blanket and spread were omitted,[4] as we found the children to be more comfortable without the weight of the covers, owing to the frequence of polyneuritis and hyperesthesia (the former referring to pain along the nerve trunks of the posterior leg and thigh, and the latter to a generalized painful condition of the cutaneous tissues). In addition to this, the covers had a tendency to increase toe-drop deformities, which are rather common when the lower limbs are paralyzed. Moreover, the doctors and nurses were at all times able to observe the position of the feet and legs. Incidentally, this method saved much linen and work, both very important factors in an epidemic of such magnitude, although this was not the reason for omitting bed covers in the beginning. In order to make up for the absence of covers, each child was clothed with a warm undershirt, a pajama suit or loose night gown, and woolen stockings; a blanket was kept folded at the foot of the bed, to be used at night or during cooler spells of weather. In the case of adults, the beds were made up in the usual way, but where any tendency to toe-drop existed, the bed covers were supported by a wooden cradle. The ordinary clay brick, well padded with cotton, and covered by a bandage, was utilized to support the feet in an upright position, for both children and adults, when this latter deformity was present.

Patient's position. With few exceptions the patients were more comfortable without a pillow under the head, because the flexion of the neck entailed by its use is very painful in poliomyelitis. It was found best to keep them lying flat on the back during the acute stage, for then there was no tension on any part of the body. Some of the older children preferred to have a pillow under their knees, as the position of slight flexion of the legs thus brought about was the one of most comfort, owing to the fact that the nerve trunks along the back of the thigh and leg are then placed under no tension and the polyneuritic pain is less. The children would usually themselves assume this position of flexion of the knees, in cases in which the neuritic pain was at all marked, as soon as the subsidence of the paralysis would permit it. When a comfortable position was found, it was considered best to allow the child to keep it.

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[4] It must be remembered that the epidemic occurred during exceedingly hot weather, hence such a method of covering the children was rational. Had the weather been very cold, a different procedure would have been necessitated.

Handling of the patient. The child should be moved only when absolutely necessary, during the early and the painful period of the disease, but if movements are made, they should be carried out with the greatest care, for pain upon handling and upon motion is often extreme, due to the generalized hyperesthesia and polyneuritis. In changing the bed linen, the patient should be lifted out of the crib and laid either upon a table or in an empty bed or crib, because turning from side to side is exceedingly painful, no matter how carefully it is carried out. This method is not possible, of course, with the adults, but they did not seem to mind being moved as much as did the children. The way in which the patient is lifted is important. It should be carried out by firmly supporting the whole body, keeping the back perfectly straight at the same time, and being careful to avoid letting a paralytic limb drag. In changing the diaper, the hand should be slipped under the back so as to raise the body, and then the diaper removed. It is needless to say the child should never be lifted by the feet, as this procedure causes considerable pain. The diaper should be adjusted so as not to "spread the thighs." This principle is often extremely hard to adhere to in hospital treatment, because when the diaper is thus arranged its thinness makes the soiling of the bedding almost unavoidable. However, it may well be carried out in private nursing, and it is of some value in that the wide separation of the thighs resulting from a thick diaper, applied in the usual way, predisposes to deformity in the paralyzed lower extremities. In order to facilitate the changing of the night dresses of the patients, they should be open, with fastenings at the back.

Pressure sores. All that a nurse has ever learned in preventing pressure sores, is none too much for use in the nursing of cases of poliomyelitis. The very fact that the children, for the most part, were well nourished and in good physical condition otherwise, was a great help in prevention of this distressing condition, but despite this fact, and vigilant as the nurse might be, cases would occur. In preventive measures certain points should be emphasized: (1) All bony prominences must be carefully watched. (2) Skin surfaces should not lie in contact. This is especially true of the spastic cases where the fingers are flexed upon the palm and the tendency toward ulceration of the surface in contact is very marked. Some absorbent cotton placed in the palm of the hand in order to keep the fingers as much open as possible was used with some success in these cases. Ulceration of the back of the head may likewise occur; pressure should be removed from the involved areas by the use of an air cushion or cotton rings. In adult patients, when the paralysis is extensive and the sphincters are involved, an air bed is almost imperative, but even then the skin may break down, more especially in poorly nourished individuals. Rubbing the skin with a solution of alcohol and alum is useful in prevention but too much reliance must not be placed upon it. It is better, instead, to encourage the return of a good circulation by washing the skin with soap and water, followed by gentle massage.

The paralyzed extremities will often feel cold to touch and the nurse may at times be led to apply external heat. This she should not do, as the patient derives no comfort thereby, and at times is rendered extremely uncomfortable; moreover, should the heat be too great and the nurse be negligent, the child in his helpless condition may suffer a severe burn, more especially as the skin of the paralyzed part is much less resistant to external influences than is a normal cutaneous surface.

Baths. Tub baths are exceedingly useful, as they exert a beneficial influence in several ways. (1) They refresh the patient and at the same time calm the nervous excitability and irritability, so prominent in a considerable proportion of poliomyelitis cases. (2) They stimulate the circulatory system in general. (3) They tend to diminish the congestion of the tissues of the nervous system, temporarily at least, by the withdrawal of blood to the capillaries of the skin. (4) The cutaneous circulation of the paralyzed part is stimulated. (5) Elimination through the skin is encouraged. (6) The warm water enables the child to move more easily and possibly with less pain than under other circumstances, and thus often entices him to make movements he probably would not otherwise attempt. The method of giving the bath is of such importance that we shall describe it at length. After the bath tub has been half filled with water, a blanket or two is folded and placed upon the bottom, while at the same time a rubber cushion is laid upon the surface of the water, to be utilized in supporting the child's head. The temperature of the water must be determined, for the bath is best given between 36 and 38° C. This being adjusted, the child should be placed in the tub. The nurse will then find it helpful to have a rubber ball or a toy balloon which she can float in the water, and in this way amuse the child, at the same time that voluntary motions on his part may be brought forth by his efforts to grasp the toys. The baths should be given once or twice in the twenty-four hours, according to the reaction previously obtained, and the duration of the bath should be about twenty minutes.

Rest. Rest is an all important part of the treatment of this disease. During the acute stage, comprising the first few weeks of illness, a child should only be disturbed when necessary for treatment. If at home, he should be kept in an exceedingly quiet and dark room. Sleep should be thus encouraged, for the entire nervous system is concerned in the inflammation, and the fewer the demands made upon it at this particular period, the better the ultimate outcome will be. Where hyperexcitability and restlessness were marked we found the use of morphine in very small doses to be of value, especially when combined with frequent hot baths and the employment of lumbar puncture.

It seemed to us, that as soon as the painful period of the disease was over, the patient should be permitted to use his muscles just as much as he desires but without undue urging. As long as pain is present in the limbs, the child has no desire to use them, and it is harmful and useless to make him walk sooner than he can do so with comfort. He will make use of his limbs of his own accord as soon as he feels able. No doubt the continuation of pain is indicative of the fact that the inflammatory process of the nervous system has not, as yet, completely subsided, and is nature's method of protection from further injury. When the patients were convalescent enough to sit up, which occurred usually in the third or fourth week, it was noticed that they were very uncomfortable and suffered considerably if propped up in bed with a back rest and with the leg at a right angle to the body, but that they could be made much more comfortable and the sitting posture attained very much earlier if they were placed at the edge of the crib, so that their legs could hang down outside the bars, at the same time that their hands grasped the latter in order to support themselves. Much the same position was obtained by using a small arm chair with a straight back and tray attached, and this particular type of chair proved of invaluable aid in getting the more severely paralyzed children up without danger of injury from falls, this latter being almost impossible with an arrangement in which the entire body was supported.

(To be continued)